Unit-4 Cells and Tissues

(MCQs)

4.1 Microscopy and the Emergance of Cell Theory

1- **The first microscope was made in:**
(A) 1995 (B) 1895
(C) 1595 (D) 1685

2- **Who developed first microscope?**
(A) Robert Hooke
(B) Louis pasture
(C) Robert Brown
(D) Zacharias Johnson

3- **The use of microscope is called:**
(A) Photography
(B) Endoscopy
(C) Microscopy
(D) Micrography

4.1.1 Light Microscopy and Electron Microscopy

4. **causing blurriness:**
(A) 2500 times
(B) 1500 times
(C) 1000 times
(D) 2000 times

5- **Magnification of Light microscope is:**
(A) 13000X (B) 1400X
(C) 1500X (D) 1600X

6- **Resolving power of a light microscope is:**
(A) 10μm (B) 0.2μm
(C) 0.3μm (D) 1.0μm

7- **The photograph taken by microscope is called:**
(A) Cardiograph
(B) Micrograph
(C) Tonograph
(D) Photograph

8- **In one millimeter, micrometers are:**
(A) 10 (B) 100
(C) 1000 (D) $\frac{1}{1000}$

9- **The movement of amoeba can be studied by:**
(A) Transmission Electron Microscope
(B) Light Microscope
(C) Electron Microscope
(D) Hand Lens

10- **How much millimeter is the resolution of human eye?**
OR **The resolving power of human eye is:**
(A) 0.05 (B) 0.01
(C) 0.1 (D) 1.0
(A) 0.1 centimeter
(B) 0.1 micrometer
(C) 0.1 millimeter
(D) 0.1 decimeter

4.1.2 History of the Formulation of Cell Theory

11- **Robert Hooke used microscope to examine Cork in _________.**
OR **Robert Hooke first described cell in:**
OR **Cell was discovered in:**
(A) 1958 (B) 1665
(C) 1560 (D) 1470

12- **In 1665, British Scientist first of all discovered cell:**
(A) Robret Brown
(B) Robert Hooke
(C) Aristotle
(D) Lamarck

13- **Robert Hooke was scientist:**
(A) Greek (B) Iranian
(C) Polish (D) British

14- **Robert Brown discovered in plants:**
(A) ribosome (B) cell
(C) Mitochondrion (D) nucleus

15- **"All cells are formed from pre-existing cells" is the saying:**
(A) Pasture
(B) Rudolf Virchow
(C) Darwin
(D) Robert Hooke

16- **The study of animal tissues is done by:**
(A) Rudolf Virchow
(B) Theoder Schwann
(C) Robert Hooke
(D) Louis Pasteur

17- **In 1831 .... discovered nucleus in cell:**
(A) Robert Brown
(B) Robert Hooke
(C) Laveran
(D) Louis Pasture

18- **Nucleus discovered in animal cell:**

(A) 1932 (B) 1931
(C) 173 (D) 1831

19- Cell was discovered in:
(A) 1665 (B) 1965
(C) 1974 (D) 1995

4.2 Cellular Structure and Functions

20- The process of glycolsis occurs in:
(A) Mitochondrion
(B) Nucleus
(C) Vacuole
(D) Cytoplasm

21- Rough endoplasmic reticulum serves a function in the synthesis of:
(A) Carbohydrates (B) Protein
(C) Lipids (D) Vitamin

22- Human body is made of about ..... type of cells:
(A) 200 (B) 300
(C) 400 (D) 500

23- Cells which form the body of organism are called:
(A) Germ cells (B) Gametes
(C) Somatic cells
(D) Parent cells

4.2.1 Cell Wall

24- In plant major component of cell wall is:
OR In the cell wall of plants the chemical present is:
(A) Lignin (B) Cellulose
(C) Chitin (D) Sodium

25- The usually major chemical compound present in the primary cell wall is:
OR The most common chemical in primary wall of plants is:
(A) Lignin (B) Cellulose
(C) Chitin (D) Peptidoglycan

26- Cell wall of Fungi has:
OR Cell wall of Funji is made of:
(A) Protein (B) Chitin
(C) Cellulose (D) Fats

27- Cell wall of prokaryotes composed of a chemical:
(A) Plasmodesmeta
(B) Peptidoglycan
(C) Chromatin
(D) Stroma

28- Chemical matter abundantly present in the wood is:
(A) Cutin (B) Lignin
(C) Albumin (D) Globulin

29- Which of these do not have cell wall?
(A) Fungi (B) Algae
(C) Prokaryotes (D) Protozoa

30- Which organism has no cell wall?
OR All livings has cell wall except:
(A) Plants (B) Bacteria
(C) Animals (D) Fungi

31- Polymer of Amino Acid and Sugar is:
(A) Peptidoglycan
(B) Glycolipid
(C) Phospholipid
(D) Glycogen

4.2.2 Cell Membrane

32- Which is not component of plasma membrane among the followings?
(A) Lipids
(B) carbohydrates
(C) Proteins (D) DNA

33- Fluid mosaic model explains the structure of:
(A) Cell wall
(B) Cell membrane
(C) Nucleus
(D) Ribosomes

34- Cell membrane is mainly composed of:
(A) Lignin
(B) Proteins and Lipids
(C) Cholesterol
(D) Peptidoglycan

35- Only few molecules can pass through it:
(A) Permeable membrane
(B) Semi permeable membrane
(C) Non permeable membrane
(D) Cell wall

36- Fluid mosaic model belongs to:
(A) Cell membrane
(B) Cell wall
(C) Dermis
(D) Endodermis

37- Elasticity of cell membrane is due to:
OR Fluidity of cell memblane is due to:
(A) Lipid (B) Glycerine
(C) Protein (D) Vitamin

4.2.4	Cytoskeleton

38- Microtubules are made up of a protein ______.
OR Microtubles are made of:
(A) Tubulin (B) Actin
(C) Lipids (D) Carbohydrate
OR (A) Tubulin protein
(B) RNA
(C) DNA
(D) Actin protein

39- Microfilaments are composed of ______ protein:
(A) tubulin (B) fibrinogen
(C) actin (D) myosin

4.2.5	Cell Organelles

40- Cisternae belongs to:
(A) Mitochondrion
(B) Golgi Appratus
(C) Vacoule (D) Nucleus

41- Chromosomes are composed of:
(A) DNA (B) RNA
(C) DNA and Protein
(D) RNA and Protein

1	Nucleus

42- Chromosomes are visible during:
(A) Interphase
(B) G1-Phase
(C) S-Phase
(D) Cell Division

43- First of all nucleus in plant cell was discovered by:
(A) Robert Hooke
(B) Robert Brown
(C) Robert Boy
(D) Schleiden

2	Ribosomes

44- Ribosomes are constructed in:
OR The site where ribosomal RNA formed is called:
(A) Endoplasmic reticulum
(B) Nucleoid
(C) Nucleolus
(D) Nucleopores

45- Sites where proteins are synthesized:
OR ______ are the sites for proteins synthesis.
(A) Mitochondria
(B) Nucleus
(C) Plastids
(D) Ribosomes

46- Function of Ribosome?
(A) Secretes secretions
(B) Synthesis of Glucose
(C) decomposition of fats
(D) Synthesis of Protein

47- Ribosome are sites of synthesizing:
(A) Protein
(B) RNA
(C) DNA
(D) Carbohydrates

3	Mitochondria

48- The organelle which produces energy is:
(A) mitochondria
(B) ribosome
(C) nucleus
(D) vacoule

49- The function of Mitochondria:
(A) Lipid storage
(B) Protein synthesis
(C) Photosynthesis
(D) Cellular Respiration

50- The sites of Aerobic Respiration in cell are:
OR Sites of respiration and major energy production centre is:
(A) Golgi bodies
(B) Mitochondria
(C) Ribosomes
(D) Nucleus

51- Which of organalles have own DNA?
(A) Chloroplsat
(B) Ribosomes
(C) Mitochondria
(D) All of these

52- The folds of internal membrane of mitochondria called:
(A) Cristae (B) Matrix
(C) Thylakoid (D) Stroma

53- The thin extensions of the inner membrane of mitochondria are known as:
OR The Thin extensions of inner mitochondrial memberane are called:
(A) Matrix (B) Cristae
(C) Stroma (D) Thylakoids

4	Plastids

54- What is the function of chloroplast?
(A) Production of ATP
(B) Production of Proteins
(C) Photosynthesis
(D) Production of ADP

55- Stroma is found in:
OR Fluid of chloroplast is called:
(A) Mitochondria
(B) Golgi Apparatus
(C) Ribosomes
(D) Chloroplast
OR
(A) Cytoplasm
(B) Cytosol
(C) Stroma
(D) Neucleoplasm

56- The stacked of Thylakoids is called:
(A) Stroma (B) Cristae
(C) Granum (D) Leucoplast

57- Plastids which are colourless are:
(A) Chloroplasts
(B) Leucoplasts
(C) Chromoplasts
(D) Lipids

6	Golgi Complex

58- Golgi was awarded Noble Prize in ______.
OR When Golgi was given nobel prize in physiology and medicine?
(A) 1908 (B) 1807
(C) 1906 (D) 1916

59- The flattened sacs in cell are called:
(A) Thylakoid (B) Cristae
(C) Cisternae (D) Centriole

7	Lysosomes

60- Lysosomes were discovered by:
(A) Camillio Golgi
(B) Robert Hook
(C) Schwann
(D) Christian Rene De due

61- Cell organelle which contain digestive enzyme:
OR Strong digestive enzymomes are found in:
(A) Ribosomes
(B) Lysosomes
(C) Centrioles
(D) Endoplasmic reticulum

4.2.7	Relationship between Cell Function and Structure

62- Human body made up of types of cells:
(A) 50 (B) 100 (C) 150 **(D)** 200

4.3	Cell Size and Surface area to Volume Ratio

63. The size of human red blood cells is:
OR The size of RBL is:
(A) 2μm (B) 4μm
(C) 6μm **(D)** 8μm

64- The smallest cells are of some bacteria e.g:
(A) Mycoplasma
(B) Cytoplasm
(C) E.Coli (D) Streptococi

65- It is the size of smallest bacterium:
(A) 0.2μm (B) 0.3μm
(C) 0.4μm **(D)** 0.1μm

4.4	Passage of Molecules Into and Out to of Cells

66- A solution has relatively more solute is called:
(A) Hypertonic (B) Hypotonic
(C) Isotonic (D) No one

67- The solution with less solute is called:
(A) Hypertonic **(B)** Hypotonic
(C) Isotonic (D) B and C both

68- The process of taking in liquid in the form of droplets is called:
(A) Diffusion (B) Phagocytosis
(C) Exocytosis **(D)** Pinocytosis

69- The movement of molecules from a region of lower concentration to higher concentration is called:
(A) Active transport
(B) Osmosis
(C) Diffusion
(D) Filtration

70- Gaseous exchange in gills and lungs occurs by the process:
(A) Diffusion
(B) Osmosis
(C) Active transport

(D) Turgor

71- Guard cells belong to:
(A) Pericycle (B) Stomata
(C) Cortex (D) Endodermis

4.5 Animal and Plant Tissues

72- Similar cells performing same function organize into group that is called:
(A) Organelle (B) Tissue
(C) Organ (D) Organ-System

4.5.1 Animal Tissues

73- In body cell responsible for co ordination are:
(A) Heart cell (B) Skin cell
(C) Nerve cell (D) Bone cell

74- Nervous system present in:
(A) Brain (B) Spinal cord
(C) Nerves (D) A,B,C

75- Cardiac muscles present in the walls of ....
(A) Heart (B) Lungs
(C) Kidneys (D) Stomach

76- Blood is a type of tissue:
(A) Epithelial (B) Connective
(C) Nervous (D) Muscle

77- Bone is an example of:
(A) Epithelial tissue
(B) Nervous tissue
(C) Connective tissue
(D) Muscle tissue

78- Which type of muscles are responsible for birds wings flapping?
(A) Skeletal Muscles
(B) Smooth Muscles
(C) Cardiac Muscles
(D) Epithelial Muscles

79- The Tissue which is composed of Nerve Cells:
(A) Connective Tissue
(B) Muscle Tissue
(C) Nervous Tissue
(D) Epithelial Tissue

4.5.2 Plant Tissues

80- Chemical matter excretes from the epidermal of leaf is:
(A) Cutin (B) Lignin
(C) Aspirin (D) Albumin

81- What is called the layer of cutin in plants?
(A) Cuticle (B) Epidermis
(C) Cortex (D) Leaf Hairs

82- The tissues of plants consists of single types of cells called:
(A) Simple tissue
(B) Nervous tissue
(C) Muscle tissue
(D) Epithelial tissue

83- The tissues of plants have ability of division called:
(A) Epidermal tissues
(B) Ground tissues
(C) Meristematic tissues
(D) Support tissues

84- In which tissues guard cells are found?
(A) Mesophyll (B) Xylem
(C) Epidermal (D) Phloem

85- Permanent tissues originate from the tissues:
(A) Epidermal (B) Meristematic
(C) Ground (D) Xylem

86- Ground tissues are made of which cells?
(A) Parenchyma
(B) Vessel elements
(C) Tracheids
(D) Sieve tubes

(Short Questions)

4.1 Microscopy and the Emergance of Cell Theory

1. Define Microscopy.
OR Define Microscopy and Magnification.

Ans. Microscopy: Microscopy is the use of microscope.
Magnification: Magnification is the increase in the apparent size of an object and it is an important factor in microscopy.

2. What is Micrograph?

Ans. The photograph taken by microscope is called Micrograph.

3. What is meant by resolving power of a microscope?

Ans. Resolution or resolving power is the minimum distance at which two objects can be seen as separate objects. It is the measure of the clarity of an image.

- **Example:** resolution of light microscope is 0.2 micrometer.

4. What is the difference between the magnification and resolution of a microscope?

OR What is meant by Magnification and Resolution.

Ans. Magnification:

Magnification is the increase in the apparent size of an object and it is an important factor in microscopy

Resolution:

Resolution or resolving power is the minimum distance at which two objects can be seen as separate objects.

4.1.1	Light Microscopy and Electron Microscopy

5. Write the names of electron microscopes which are used by biologists.

OR Write the names of types of electron microscope.

Ans. Biologists use two types of electron Microscopes as following:

(i) Transmission Electron Microscope (TEM)

(ii) Scanning Electron Microscope (SEM)

6. Differentiate between transmission electron microscope and scanning electron microscope.

OR Define Transmission Electron Microscope.

OR What is scanning electron microscope?

Ans. Transmission Electron Microscope:

In Transmission electron microscope, electrons are transmitted through the specimen. It is used to study the internal cell structure.

Scanning Electron Microscope:

Scaning electron microscope is used to study the structure of cell surface. In SEM electrons are reflected from the metal coated surface. It is used to study the structure of cell surfaces.

4.1.2	History of the Formulation of Cell Theory

7. Write main points (principles) of cell theory.

OR Write down the principles of cell theory.

OR State the cell theory.

Ans. Cell theory includes the following principles.

(i) All organisms are composed of one or more cells.

(ii) Cell is the smallest living things cell is the basic unit of organization of all organisms.

(iii) Cells arise only by divisions in previously existing cells.

8. Describe the contribution of Mathias Schielden and Theodar Schwann in formation of cell theory.

OR What is meant by Mathias Schielden and Theodar Schwann?

Ans. Contribution of Matthias Schleiden: In 1838, a German botanist Matthias Schleiden studied plant tissues and made the first statement of the cell theory. He stated that all plants "are aggregates of individual cells which are fully independent."

Contribution of Theodor Schwann: After one year of Scheilden's statement in 1839, a German zoologist Theodor Schwann reported that all animal tissues are also composed of individual cells. Thus Schleiden and Schwann proposed cell theory in its initial form.

9. What are the contributions of Rudolf Virchow and Louis Pasteur in the formation of Cell Theory?

Ans. Contribution of Rudolf Virchow:

In 1855 Rudolf Virchow, a German physician, proposed an important extension of cell theory. He proposed that all living cells arise from pre-existing cells.

Contribution of Louis Pasteur: In 1862, Louis Pasteur provided the experimental proof of this idea.

10. How "Robert Hooke" introduced cell?

Ans. Cells were first described by a British scientist, "Robert Hooke" in 1665. He used his self made light microscope to examine a thin slice of cork. Hooks observed a 'honey comb' of tiny empty compartments. He called the compartments in cork as "Cellulae". His this term has come to us a "cell".

11. Describe one achivement of each Robert Hook and Robert Brown.

Ans: Robert Hooke was British scientist in 1655 first time he describe cell and Robert Brown was a British botanist in 1831 he discovered nucleus in the cell.

4.2 Cellular Structure and Functions

4.2.1 Cell Wall

12. What is meant by cell wall? In which living things is it present?

Ans. Cell wall is a non-living and strong component of cell, located outside plasma membrane. Not all living oranisms have cell wall around their cells e.g. animals and many animal like protists do not have cell wall. Prokaryotes and plants like protists have cell wall is present in all plants.

13. Describe the composition of cell wall of Fungi and Prokaryotes.

Ans. Cell wall of fungi:

Chitin is present in the cell wall of fungi.

Cell wall of prokaryotes:

Prokaryotes have a cell wall composed of peptidoglycan that is a complex of amino acids and sugars.

14. What is difference between primary and secondary wall?

Ans. Primary Wall:

The outer layer of the plant cell wall is known as primary wall and cellulose is the most common chemical in it.

Secondary Wall:

Some plant cells, such as xylem cells, also have secondary walls on the inner side of the primary wall. It is much thicker and contains lignin and other chemicals.

15. Define Plasmodesmata.

Ans. There are pores in the cell wall of adjacent cells, through which their cytoplasm is connected. These pores are called plasmodesmata.

4.2.2 Cell Membrane

16. What do you know about Fluid Mosaic Model?

OR What is Fluid Mosaic Model?

Ans.

(i) According to Fluid mosic model, there is a lipid bilayer in which the protein molecules are embedded.

(ii) The lipid bilayer gives fluidity and elasticity to membrane.

(iii) Small amounts of carbohydrates are also present in cell membrane. These are joined with proteins or lipids of membrane.

(iv) In Eukaryotic Cells, cholesterol is also present in lipid bilayer.

17. Describe two functions of cell membrane.

Ans. Following are two functions of cell membrane;

i) Cell membrane helps in the Maintenance of cells internal composition.

ii) Cell membrane also sense chemical massages and can identify other cells.

18. What is difference between cell membrane and plasma membrane?

Ans. There is no difference between cell membrane and plasma membrane. Both are alternative names of each other.

19. What is difference between cell wall and cell membrane?

Ans. Cell Membrane:

(i) Cell membrane is a thin and ealstic membrane covering the cytoplasm.

(ii) Cell membrane made up of lipids and proteins.

Cell Wall:

(i) Cell wall is a non living and strong component of cell which is present outside the cell.

(ii) Cellulose is the most common chemical in the cell wall of plants which cover cell membrane.

20. Why is plasma membrane called semi-permeable membrane?

OR Define semi permeable membrane?

Ans. Plasma membrane is called semi-permeable membrane as it allows only selective molecules to pass out of the cell and keep the most of the molecules inside the cell. In this way it helps to maintain the chemical structure of the cell.

4.2.3 Cytoplasm

21. Which is called Cytoplasm? Which organic molecules are in it?

Ans. Cytoplasm is the semi-viscous and semi-transparent substance between plasma membrane (cell membrane) and nuclear envelope. It contains water in which many organic molecules (proteins, carbohydrates, lipids) and inorganic salts are completely or partially dissolved.

22. Describe two functions of Cytoplasm.

Ans. Following are two functions of cytoplasm;

(i) The cytoplasm of the cell provides space for the proper functioning of the organelles.

(ii) It acts as the site for various metabolic reactions, for example, Glycolysis.

4.2.4 Cytoskeleton

23. Write about Cytoskeleton.
OR What is Cytoskeleton?

Ans. Cytoskeleton is a network of microfilaments and microtubules. Microtubules are made up of tubulin protein and are used by cells to hold their shape. They are also the major component of cilia and flagella. Microfilaments are thinner and are made up of actin protein. They help cells to change their shapes.

24. What is difference between microtubules and microfilaments?

Ans. Microtubules:

(i) Microtubules are made up of tubulin protein.

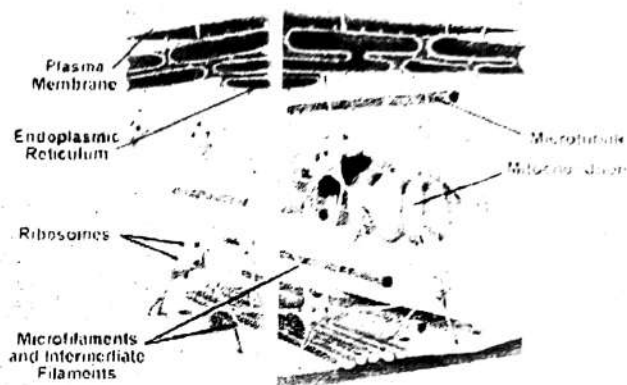
(ii) Microtubules maintain the shape of cell.

(iii) Microtubules are also major part of structure of Cilia and Flagella.

Microfilaments:

(i) Microfilaments are madeup of Actin protein.

(ii) Microfilaments are finer than microtubutes.

(iii) Microfilaments help cell to change its shape.

4.2.5 Cell Organelles

25. Write the names of any four cell organelles.

Ans. i- Mitochondria
ii- Ribosomes
iii- Lysosomes
iv- Plastids.

26. Write name of any two subcellular particles.

Ans: Prions and viroids are acellular particles like viruses. They are also known as sub cellular particels w.r.t evolution.

27. What down names of two organelles found in eukaryotic cells.

Ans. i) Mitochondria
ii) Ribosomes

1 Nucleus

28. Where chromosomes found? What is their composition?

Ans. Chromosome are found in nucleoplasm. Chromosomes are composed of deoxy ribonucleic acid (DNA) and proteins.

29. What is the role of nucleus in a cell?

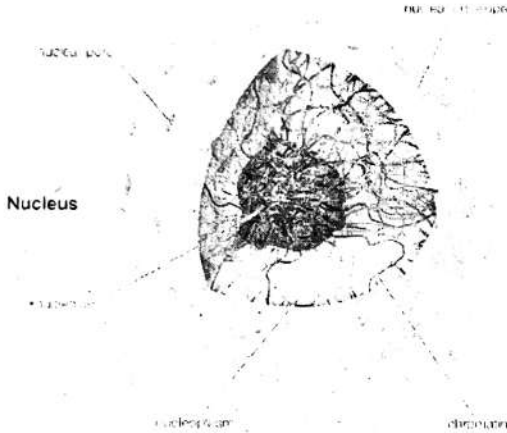
Ans. Nucleus contains hereditary material which not only controls all activities of a cell but also responsible for transmission of character to next generation.

30. What is nuclear envelope?

Ans. Nuclear Envelope:

i. Nucleus is surrounded by a double membrane that is called nuclear envelope.

ii. Nuclear envelope contains many tiny pores which makes it a semi-permeable membrane.

iii. Nuclear envelope surrounds a granular fluid called Nucleoplasm.

2	Ribosomes

31. Define Ribosomes. Also describe the importance of Ribosomes.

Ans. Ribosomes: Ribosomes are tiny grandular structures that are either floating freely in cytoplasm or are bound to endoplasmic reticulum (ER). Each ribosome is made up of almost equal amounts of proteins and ribosomal RNA (rRNA). Ribosomes are not bound by membranes and are also found in prokaryotes. Eukaryotic ribosomes are slightly larger than prokaryotic ones.

Fucntion: Ribosomes are the sites of protein synthesis. Protein synthesis is extremely important to cells, and so large numbers of ribosomes are found throughout cells. When a ribosome is not working, it disassembles into two smaller units.

32. Where Ribosomes found?

OR Describe structure and function of Ribosomes.

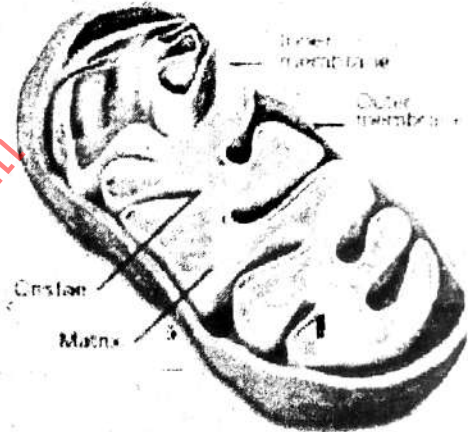
OR Give function Performed by Ribosomes.

Ans. Ribosomes are tiny granular structures that are either floating in cytoplasm or bound to endoplasmic reticulum. They play role in protein synthesis.

Fucntion: Ribosomes are the sites of protein synthesis. Protein synthesis is extermely important to cells, and so large numbers of ribosomes are found throughout cells. When a ribosome is not working, it disassembles into two smaller units.

3	Mitochondria

33. Draw the diagram of mitochondria and write the name of its two parts.

Ans:

34. Write function of Mitochondria.

OR What is the function of Mictochondria?

Ans. Mitochondria are the sites of aerobic respiration and are the major energy production centres.

35. Differentiate between cristae and cisternae.

Ans: Cristae:

(i) Cristae are the foldings of inner mitochondrial membrane.

(ii) Cristae are present in mitrochondria.

(iii) Electron transport chain occurs in cristae.

Cisternae:

(i) Cisternae are the flattened structures of golgi apparatus.

(ii) Cisternae are present in golgi apparatus and endoplasmic reticulum.

(iii) Modification of proteins into final products occurs in cisternae.

4 Plastids

36. What are plastids? Name their kinds.

Ans. Plastids: Plastids are membrane-bound organelles that only occur in plants and photosynthetic Protists (algae).

Types of Plastids: There are three types of plastids:

(i) Chloroplasts (ii) Chromoplasts

(iii) Leucoplasts

37. What are chromoplasts?

Ans. The second type of plastids in plant cells are chromoplasts. They contain pigments associated with bright colours and are present in the cells of flower petals and fruits.

Functions: Their function is to give colour to these parts and thus help in pollination and dispersal of fruit.

38. What are Leucoplasts? Where dose they Occur?

Ans. Leucoplast are colourless and store starch, proteins and lipids. They are present in the cell of those parts where food is stored.

39. What are the functions of Leucoplasts and Chromeplasts?

Ans. Functions of Leucoplast: These are colourless and store starch, proteins and lipids.

Functions of Chloroplasts: They are the sites of photosynthesis in eukaryotes. Chloroplast is a type of plastids. They are green in colour.

40. What are the functions of Leucoplasts and Chloroplast?

OR Write down about Leucoplasts.

Ans. Leucoplasts is Type of plastid chloroplast are green color.

Functions of Leucoplast: These are colourless and store starch, proteins and lipids.

Functions of Chloroplasts: They are the sites of photosynthesis in eukaryotes.

41. Describe function of thylakoids.

Ans. Thylakoids: They are sacs like structures formed by the inner membrane of chloroplast present in plant. Its stack is known as granum which float in the inner fluid of chloroplast i.e. stroma.

Functions:

i) Thylakoids contains protein complex molecule which play vital role in photosystems I & II.

ii) Thylakoids are the sites for light-depending reactions of photosynthesis.

42. What is difference between Thylakoids and Stroma?

Ans. Thylakoids:

Like mitochondria Chloroplast is also bound by a double membrane. The outer membrane is smooth while the inner membrane gives rise to sacs called thylakoids.

Stroma:

The stack of thylakoids is called granum (plural = grana). Grana float in the inner fluid of chloroplast i.e. stroma.

5 Endoplasmic Reticulum

43. What is Endoplasmic Reticulum. Write name of its type.

Ans. Endoplasmic Reticulum: Endoplasmic reticulum is a network of interconnected channels that extends from cell membrane to nuclear envelop. The network exists in two forms.

(i) Rough Endoplasmic Reticulum

(ii) Smooth Endoplasmic Reticulum

44. Why endoplasmic reticulum is called rough and smooth endoplasmic reticulum?

OR Differentiate between rough and smooth andoplasmic reticulam.

Ans. Rough Endoplasmic Reticulum (RE):

Rough Endoplasmic Reticulum (RE) is so-named because of its rough appearence due to numerious ribosomes that are attached to it. Due to the presence of ribosomes, RER serves a function in protein synthesis.

Endoplasmic Reticulum (SER):

(SER) lacks ribosomes and is involved in lipid metabolism and in the transport of materials from one part of cell to the other and looked smooth so it is called SER.

f45. Write the function of smooth

endoplasmic reticulum.

OR Describe two functions of smooth endoplasmic reticulum.

Ans. Functions of smooth Endoplasmic Reticulum:

(i) It is involved in lipid metabolism and in the transport of materials from one part of the cell to the other.

(ii) It also detoxifies the harmful effect of chemicals that have entered cell.

46. Define Chromoplast and Leucoplast.

Ans: Chromoplast: The second type of plastids in plant cells are chromoplasts. They contain pigments associated with bright colours and are present in the cells of flower petals and fruits.

Leucoplasts: Leucoplast are colourless and store starch proteins and lipids. They are present in the cell of those parts where food is stored.

6	Golgi Apparatus

47. In which fields did Golgi win noble prize in 1906?

Ans. In 1906, Golgi was awarded Nobel prize for Physiology and Medicine.

48. Write the functions of golgi apparatus.

Ans. Golgi apparatus was discovered by Italian physician **Camillo Golgi.** It is found in both plant and animal cells.

i) **Functions:** It modifies molecules coming from rugh ER and packs them into small membrane bound sacs called Golgi vesicles and transport them to various locations in cell or to its exterior, in the form of secretions.

7	Lysosomes

49. What is Lysosomes?

Or Describe the function of Lysosomes.

Ans. Lysosomes contain strong digestive enzymes and work for the breakdown (digestion) of food and waste materials within cell. During its function, a lysosome fuses with the vacuole that contains the targeted material and its enzymes break down the material.

50. What is the function of lysosomes in the cell?

OR What is function lysosomes?

OR Write two functions of lysosomes.

Ans. Function: Lysosomes contain strong digestive enzymes and work for the breakdown (digestion) of food and waste materials within cell. During its function, a lysosome fuses with the vacuole that contains the targeted material and its enzymes break down the material.

8	Centrioles

51. Where do the centriole? Write down the function of centriole.

OR Write two functions of Centrioles.

OR Write note on centrioles.

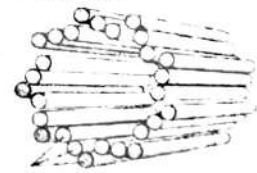
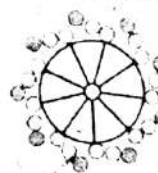
OR Differentiate between centrome and centrioles?

OR Write two functions of Centrosome.

Ans. Centrioles:

Animals and many unicellular organisms have hollow and cylindrical organelles known as centrioles. Each centriole consists on nine triplets of microtubules (made up of tubulin protein).

Centrosome:

In animals the outer surface of nucleur contains two centriotes which are known as centrosome. Their function is to help in the formation of spindle fibers during cell division. In some cells, centrioles are involved in the formation of cilia and flagella.

9	Vacuoles

52. Describe functions of vacuoles in a cell.

Ans. Function of Vacuoles in a Cell:

(i) Vacuole in plant cell provides turgidity.

(ii) Many cells take materials from outside in the form of food vacuole.

53. What is Exocytose?

Ans. It is the process through which bulky materials is exported.
This process adds new membrane which replaces the part of cell membrane los during endocytosis.

4.2.6	Difference between Prokaryotic and Eukaryotic Cells

54. Write difference between prokaryotes and eukaryotes.

Ans. Prokaryotes:
1. They have no prominent nucleus.
2. Ribosomes are smaller than eukaryotic cells.

Eukaryotes:
1. They have prominent nucleus in their cell.
2. Ribosomes are larger than prokoryotes.

4.3	Cell Size and Surface area to Volume Ratio

55. How cells work as an open system?

Ans. A cell works as an open system i.e. it takes in substances needed for its metabolic activities through its cell membrance. Then it performs the metabolic processes assigned to it. Products and by-products are formed in metabolism. Cell either utilizes the products or transports them to other cells. The by-products are either stored or are excreted out of cell.

56. How active transport is different from passive transport?

Ans: Passive transport is the movement of molecules from an area of higher concentration to the area of lower concentration energy is not used in this process where as active transport is the movement of molecules from an area of lower concentration to the area of higher concentration and this movement require energy in the form of ATP.

4.4	Passage of Molecules Into and Out of Cells

1	Diffusion

57. Define Diffusion.

Ans. Diffusion is the random movement of solute molecules from their higher concentration towards their lower concentration. Energy is not required in this process.

58. What is meant by passive diffusion?

OR Define passive diffusion.

Ans. Movement of molecules from an area of its high concentration to an area of its low concentration is called diffusion. As cell consumes no energy in diffusion of molecules across the membrane, hence diffusion is also termed as passive diffusion.

2	Facilitated Diffusion

59. Define facilitated diffusion.

Ans. Many molecules do not diffuse freely across cell membranes because of their size or charge. Such molecules are taken into or out of the cells with the help of transport-protein present in cell membranes. When a transport protein moves a substance from higher to lower concentration, the process is called facilitated diffusion. It is the type of passive transport.

3	Osmosis

60. What is meant by Osmosis? Also define active transport.

OR Define Osmosis.

Ans. Osmosis: Osmosis is the movement of water across a semi permeable membrane from a solution of lesser solute concentration to a solution of higher solute concentration.

Active Transport: It is the movement of molecules from an area of lower concentration to the area of higher concentration. This movement against the concentration gradient requires energy in the form of ATP.

61. What is difference between diffusion and osmosis?

OR What is the difference between Diffusion and Osmosis?

Ans. Diffusion:
Diffusion is the movement of molecules from the area of higher

concentration towards the area of lower concentration.

Osmosis:
Osmosis is the movement of water across a semi permeable membrane from a solution of lesser solute concentration to a solution of higher solute concentration.

62. Define reverse osmosis.
OR Write the act of reverse osmosis.
Ans. In advanced water-treatment technologies, membrane-based filtration systems are used. In this process, semi-permeable membranes separate salts from water called reverse osmosis.

63. Define Plasmolysis.
Ans. Plasmolysis is the shrinkage of cytoplasm due to exosmosis of water is called plasmolysis.

64. What is meant by Hypertonic and Hypotonic solutions?
Ans. Hypertonic: A solution having relatively more solute is called Hypertonic solution.
Hypotonic: A solution having relatively less solute is called Hypotonic solution.

65. Define Turgor Pressure. OR Explain Turgar Pressure.
Ans. When vacuole increases in size, cytoplasm presses firmly against the interior of cell wall, which expands a little. Due to strong cell wall, plant cell does not rupture but instead becomes rigid. In this condition, the outward pressure on cell wall exerted by internal water is known as turgor pressure and the phenomen on is know as turgor.

4 Filtration

66. What is filteration?
Ans. Filteration is a process by which small molecules are forced to move across semi-permeable membrane with the aid of hydrostatic (water) pressure or blood pressure.

5 Active Transport

67. Define sodium- potassium pump.
Ans. Sodium-potassium pump: In this process, carrier proteins of cell membrane use energy to move the molecules against the concentration gradient.
Example: The membranes of nerve cells have carrier proteins in the form of "sodium-potassium pump".

6 Endocytosis

68. What is Endocytosis? Give types.
Ans. Definition: Endocytosis is the process of cellular ingestion of bulky materials by the infolding of cell membrane.
Types of endocytosis:
(i) Phagocytosis (ii) Pinocytosis

69. What is meant by Pinocytosis?
Ans. In pinocytosis cell takes in liquid in the form of droplets. Pinocytosis is a type of endocytosis.

70. Differentiate between phagocytosis and Pinocytosis.
Ans. In phagocytosis cell takes in solid material while in pinocytosis cell takes liquid in the form of droplets.

71. What is Exocytose?
Ans. It is the process through which bulky materials is exported.
This process adds new membrane which replaces the part of cell membrane lost during endocytosis.

72. Differentiate between Endocytosis and Exocytosis.
Ans. Endocytosis:
It is the process of cellular ingestion of bulky materials by the infolding of cell membrane.
Exocytosis:
It is the process through which bulky materials is exported from the cell.

7 Exocytosis

73. Differentiate between Skeletal Muscles and Smooth Muscles.
OR How are smooth muscles?
Ans. Skeletal Muscles:
Skeletal muscles or striated muscles are attached to bones. Their cells are striated (striped) and contain many nuclei. They are responsible for the movements of bones.
Smooth Muscles:
Smooth muscles are found in the walls of alimentary canal, urinary

bladder, blood vessels etc. They contain smooth muscle. They are responsible for the movement of substances.

74. Name any two types of epithelial tissue.

Ans. Indtroduction:
Epithelial tissues are found in animals. These tissue covers the outside of body and lines, organs and cavities. This tissue has many types on the basis of cells as well as the number of cell layers, The name of two types are given below.
i) Cuboidal epithelium ii) Columnar epithelium

4.5 Animal and Plant Tissues

4.5.1 Animals Tissues

4.5.2 Plants Tissues

75. Differentiate between simple tissues and compound tissues in plants.

OR Distinguish between simple tissues and compound tissues of plants.

Ans. Simple Tissues:

i. Simple tissues are tissues present in plants and are composed of only one type of cells.
ii. Simple tissues are of further two types as following.
a) Meristematic tissues.
b) Permanent tissues.

Smooth Muscles:

i. Complex tissues are tissues present in plants and are composed of more than one types of cells.
ii. Complex tissues are of two types.
a Xylem tissues.
b) Phloem tissues.

76. Write names of types of Simple Tissues.

Ans. These are the plants tissue composed of single type of cells. There are two types.
(i) Meristematic tissues
(ii) Permanent tissues

77. What are sclerenchyma tissues?

OR Describe briefly scierenchyma tissues?

Ans. Sclerenchyma tissues are composed of cells with rigid secondary cell walls. Their cell walls are hardened with lignin, which is the main chemical component of wood. Mature sclerenchyma cells cannot elongate and most of them are dead.

78. Define Support tissue and write names of types of support tissues.

Ans. Support tissues provide strength and flexibility to plants. It is of two types:
i- Collenchyma tissue ii- Sclerenchyma tissue.

79. Define Permanent tissues. Name its types.

Ans. Permanent tissues originate from meristematic tissue. The cells of these tissues do not have the ability to divide. There are the following types:
i- Epidermal tissues
ii- Ground tissues.
iii- Support tissues.

80. What do you mean by inter-catary meristem?

Ans. Inter-calary meristem is in the form of small patches among the mature tissues. These are common in grasses and help in the regeneration of parts removed by herbivores etc.

81. Define Meristematic Tissue.

Ans. Meristematic Tissues: Meristematic Tissues are composed of cells, which have the ability to divide.

Examples:
(i) Apical Meristamatic Tissue.
(ii) Lateral Meristematic Tissue.

82. What is difference between xylem and phloem tissue?

OR Write down the structure and function of Xylem tissue.

OR What is the role of Xylem tissue in Plants?

Ans. Xylem Tissues:
(i) Xylem tissue is responsible for the transport of water and dissolved substances from roots to the aerial parts.
(ii) Two types of cell are found in xylem tissue vessels elements and tracheids.

Floem Tissues:
(i) Phloem tissue is responsible for the conduction of dissolved organic matter (food) between different parts of the plant body.

(ii) Two types of cell are found in plants tissue Sieve tube cells and companion cells.

83. What is meant by collenchyma tissue?

Ans: Collenchyma Tissues are found in cortex (beneath epidermis) of young stems and in the midribs of leaves and in petals of flowers. They are made of elongated cells with unevenly thickened primary cell walls. They are flexible and function to support the organs in wich they are found.

Long Question (Unsloved)

4.1 4.1.1

1. Write a short note on light microscope.

4.1.2

2. Write three main principles / postulates of cell theory.

4.2

3. Explain the difference between plant cell and animals cell with diagram.

OR Draw a diagram of ultra structure of plant cell and label its any six parts.

4.2.1

4. Describe the structure cell wall.
5. Describe relationship between cell function and structure.

4.2.2

6. Explain the structure of cell membrane with diagram.

OR Write a note on structure and function of cell membrance.

OR Describe functions of Cell Membrane and explain Fluid Mosaic Model.

4.2.5

7. What are plastids? Give their types and functions.

OR Describe three types of Plastids.

OR What are plastids? Describe their types.

8. What is the function of Nucleus in cell? Make Labelled diagram.

OR Write a note on Nucleus.

9. What do you know about centerioles?
10. Write down a note on vacuole.
11. What are plastids? Describe its various types.
12. Describe structure and function of Endoplasmic reticulum.

OR Explain the structure of Endoplasmic Reticulum with diagram.

13. Explain the types of Endoplasmic Reticulum.
14. Write down the structure and function of ribosomes.
15. Write a note on Mitochondria and draw its diagram.

4.2.6

16. Explain the major differences between prokaryotic and eukaryotic cells.

OR Differentiate between prokaryotic and eukaryotic cells.

OR Write 3/5 difference between prokaryotic and eukaryotic cells.

4.3

17. How surface area to volume ratio limits cell size? Explain.

4.4

18. Write the differences of diffusion and active transport process.
19. Write the importance of osmosis in plants.
20. Explain Endocytosis and Excocytosis Process.

OR Describe Lock and Key Model and induced Fit Model in detail.

21. Write note on osmosis and diffusion.

4.5 4.5.1

22. What do you know about animals tissues?
23. Describe the types of Epithelial tissues.

OR Describe epithelial tissues of animals.

OR Write a note about Epithelial Tissues along with its structure and function.

OR What is meant by Epithelial Tissues? Explain its four types.

OR Expalin the types of epithelial tissues.

24. Write a note on muscles and nervous tissues of animals.

OR Describe muscles tissues with different types.

OR Write note on Nerve Tissues.

4.5.2

25. Write a detailed note on meristematic tissues in plants.

OR Explain the types of meristematic tissues in Plants.

OR What are meristematic tissues? Explain its two types.

26. Describe compound (complex) tissues of plants.

OR. Explain the structure and functions of Xylum and Phaloen tissues.

OR Write a note on compout tissues.

OR Define compound tissues and explain compound tissues found in vascular plants.

27. Write a note on epidermal and ground tissue in plants.

Unit-5 Cell and Tissues

(MCQs)

5.1 Cell Cycle

1- In which stage of the cell cycle most cell spend their lives:
(A) Prophase (B) Metaphase
(C) Telophase **(D)** Interphase

2- The phase in which cell prepare it slef for division is called :
OR During the cell cycle the metabolic activities of cell are very high at:
(A) Inter phase
(B) prophase
(C) metaphase
(D) anaphase

3- Interphase divided in .... steps:
(A) Three (B) Two
(C) Five (D) Four

4- In which stage of cell cycle the cell is preparing enzymes for chromosomes duplications?
(A) G-1 (B) G-2 (C) S (D) M

5- The phase in which cell prepares proteins that are essential for production of spindle fibers called:
(A) G I phase (B) S-phase
(C) G-2 phase (D) G0 phase

6- The phase in which S-phase cell duplicates its G0-phase chromosomes:
OR Duplication of chromosomes takes place in phase:
(A) G-1 phase **(B)** S-phase
(C) G-2 phase (D) G0- phase

7- At which stage of cell cycle cell stop dividing:
(A) G 0 (B) G 1 (C) G 2 (D) S

8- Whose cells never enter in G-0 phase?
(A) Liver (B) Kidney
(C) Nerves **(D)** Epithelial

5.2 Mitosis

9- Mitosis was discovered by:
(A) Pasteur
(B) Darwin
(C) Walther Flemming
(D) Lamarck

10- During mitosis one cell divided into daughter cells:
OR Mitosis is a cell devision in which one cell devided into .... cells:
(A) 2 (B) 3 (C) 4 (D) 8

5.2.1 Phases of Mitosis

11- Phases of mitosis are:
(A) One **(B)** Two
(C) Three (D) Four

12- In which phase of mitosis nuclear envelope of cell is breaken down?
(A) Prophase (B) Metaphase
(C) Anaphase (D) Telophase

13- In which phase of cell division spindle fibers appear?
(A) Prophase (B) Metaphase
(C) Telophase (D) Anaphase

14- The chromosomes arrange themselves along the equator of the cell in this phase.
OR During this phase chromosomes are arranged at equator of cell:
(A) prophase **(B)** metaphase
(C) anaphase (D) telophase

15- Division of cytoplasm is called:
(A) Karyokinesis
(B) Phragmoplast
(C) Phagocytosis
(D) Cytokynesis

16- The division of nucleus is called:
(A) Cytokynesis
(B) Tetrades
(C) Chiasmeta
(D) Karyokinesis

17- Karyokinesis is the division of:
(A) Nucleus (B) Cell
(C) Prophase (D) Tissues

18- Which phase of cell division is very different in plants and animals.
(A) Metaphase (B) Anaphase
(C) Telophase **(D)** Cytokynesis

19- Which protein is use in the formation of spindle fibers during mitosis?
(A) Albumin **(B)** Tubulin
(C) Glubulin (D) Adrenaline

20- Complete set of spindle fibers is called:
(A) Chromatin
(B) Mitotic spindle
(C) Kinetochore
(D) Phragmoplast

5.2.2 Significanceof Mitosis

21- Process of Regeneration is found in:
OR Which animal can recreate its lost fings by mitosis?
(A) Hydra (B) Sea Star
(C) Cow (D) Sheep

22- Sea star gains its lost arm by:
(A) Budding (B) Meosis
(C) Mitosis (D) Fregmentation

23- Change in genes is called:
(A) Regeneration (B) Mutation
(C) Growth (D) Budding

24- When tumors remain in their orginal location are called"
OR The tumors that remain in their original location are called:
(A) Benign tumors
(B) Malignant tumors
(C) Metastasis
(D) None of these

25- Process of formation of new tumors is known as:
(A) Synapsis
(B) Crossing Over
(C) Metastasis
(D) Regeneration

26- Tumors are produced as a result of errors in:
(A) Meosis
(B) Mitosis
(C) Binary fission
(D) Multiple fission

27- Errors in the control of mitosis may cause:
(A) Cancer (B) Ulcer
(C) Constipation (D) Diarrhoea

28- Budding process is found in:
(A) Fern (B) Onion
(C) Cockroach (D) Hydra

5.3 Meiosis

29- The word meiosis derived from Greek means:
(A) To shorten
(B) To make greater
(C) To cut
(D) To duplicate

30- Oscar Hertwig discovered meiosis in:
(A) 1875 (B) 1876
(C) 1877 (D) 1878

31- In 1876 meiosis was discovered by:
(A) August Weisman
(B) Oscar Hertwig
(C) Walther Fleming
(D) Golgi

32- In meiosis, one diploid eukaryotic cell divides to generate how many daughter cells?
OR During Meiosis one cell divides into daughter cells:
(A) 2 (B) 3 (C) 4 (D) 5

33- Which of the following phase of cell division is reduction division?
(A) Meiosis-I (B) Meiosis - II
(C) Mitosis (D) Anaphase

34- Chromosomes are composed of:
(A) DNA and Protein
(B) RNA and Protein
(C) DNA and Lipids
(D) RNA and Lipids

5.3.1 Phases of Meiosis

35- In which Thomas Hunt Morgan observed the phenomenon of crossing over?
(A) Bat (B) Mosquito
(C) Fruit fly (D) Sparrow

36- Which of the following distinguishes Meiosis from Mitosis:
(A) The chromosome number is reudced.
(B) Chromosomes undergo crossing over.
(C) The daughter cells are genetically different from the parent cell.
(D) All these

37- The exchange of parts of chromatids of homologous chromosomes is called:
(A) Chiasmata
(B) Crossing over
(C) Linkage
(D) Phragmoplast

38- The phase in which crossing over occur:
(A) Anaphase I
(B) Metaphase I
(C) Prophase I
(D) Prophase -I

39- Cheasmata are formed:
(A) Prophase -I

(B) Metaphase I
(C) Prophase I
(D) Anaphase I

5.3.1 Significance of Meiosis

40- Which event distinguishes meiosis from mitosis:
(A) Breakage of nuclear envelope
(B) condensation of chromosomes
(C) Pairing of homologous chromosomes
(D) Formation of metaphase plate

41- The longest phase of Meosis is:
(A) Metaphse-I (B) Anaphse-I
(C) Telophase-I (D) Prophase-I

5.3.2 Errors in Meiosis

42- Those cells which give rise to gametes are:
(A) Somatic cells
(B) Spindle fibres
(C) Germ line cells
(D) Synapsis

5.4 Apoptosis And Necrosis

43- Cells die each day apoptosis in an adult human:
(A) 50-100 billion
(B) 50-80 billion
(C) 50-90 billion
(D) 50-70 billion

44- Programmed cell death is called:
(A) Apoptosis (B) Necrosis
(C) Osmosis (D) Meiosis

45- What is called the accidental death of cells and living tissues?
OR Accidental death of cell is called:
(A) Apoptosis
(B) Necrosis
(C) Cell generation
(D) Fregmentation

46- During Apoptosis, Cell Membrane makes irregular buds called:
(A) Apoptotic Bodies
(B) Blebs
(C) Chromatin Bodies
(D) Tumors

(Short Questions)

5.1 Cell Cycle

1. Define cell cycle.
OR Define cell cycle. Name its two major phase.

Ans. Anabolism: Anabolism include all those biochemical reaction in which larger molecules are formed from smaller molecules. Energy is used in anabolism.
Catabolism: Catabolism include all those biochemical reactions in which smaller molecules are formed from larger molecules. Energy is released during cataboloism.

2. Name two phases of cell cycle. Which phase is divided into three phases?

Ans. Phases of cell cycle:
(i) Interphase
(ii) Mitotic phase or M-phase

Phases of Interphase:
(i) G1 phase (ii) S-phase
(iii) G2 phase

3. What is G-1 phase?

Ans. G1 phase is the first phase of cell cycle in which the cell increases its supply of proteins, increases the number of many of its organelles, and grows in size. Various enzymes that are required in the next S phase for DNA replication is also produced in G1 phase.

4. Write types of Reproduction.

Ans. Types of Reproduction:
(i) Asexual Reproduction
(ii) Sexual Reproduction

Note: Vegetative Reproduction is infact a form of Asexual Reproduction which occurs both naturally and artificially.

5. Differentiate between chromatin and chromosome.

Ans. Chromatin:
Chromatin is the hereditary material in nucleus in the form of loose, thread like form. It is present normally when cell is not dividing.
Chromosomes:
At the on set of prophase, chromatin condenses into highly ordered structures called chromosomes.

6. Differentiate between interphase and mitotic phase.

Ans. Interphase:
Interphase is the phase between two consecutive mitotic phase. During interphase metabolic activities of cell

rises Interphase is further divided into three steps.

1. G1-phase 2. S-phase 3. G2-phase.

Mitotic Phase:

It is a short phase of cell cycle. During mitotic phase, cell undergoes division to produce daughter cells. Mitotic phase is further divided into two main steps.

1. Karyokinesis
2. Cytokinesis.

7. Explain S-Phase in cell cycle.

OR What is S-Phase in cell cycle.

Ans. In S-phase, cell duplicates its chromosomes. As a result each chromosome consists of two sister chromatids.

8. What is meant by G0 phase?

OR Define Go phase.

Ans. In multicellular eukaryotes, cells enter G0 phase from G1 and stop dividing. Some cells remain in G0 for indefinite period e.g. neurons. Some cells enter G0 phase semi-permeable e.g. some cells of liver and kidney. Many cells do not enter G0 and continue to divide throughout an organism's life, e.g. epithelial cells.

9. What is meant by G-1 phase?

Ans. G1 phase is the first phase of cell cycle in which the cell increases its supply of proteins, increases the number of many of its organelles, like milochondria and ribosomes and grows in size. Various enzymes that are required in the next S phase for Duplication of chromosomes is also produced in G1 phase.

10. Describe G2 phase.

OR What is main function during G2 Phase of cell cycle?

Ans. In G2 phase, cell prepares proteins that are essential for mitosis, mainly for the production of spindle fibres. After the G2 phase of interphase, cell enters the division phase i.e. M phase.

5.2 Mitosis

11. When and who discovered the process of Mitosis?

Ans. In 1880s, a Germen biologist Walther Flemming observed that in a dividing cell, nucleus passes through a series of changes which he called mitosis.

12. Define mitosis. In which cells it occurs?

Ans. Mitosis is the type of cells division in which a cell divides into two daughter cells, each with the same number of chromosomes as were present in parent cell.

13. How is metaphase plate formed?

Ans. Chromosomes arrange themselves at the equator region in metaphase of Karyokinesis division of mitosis and hence forms metaphase plate.

14. Define Mitosis and Mitotic Spindle.

Ans: Mitosis: Mitosis is the type of cells division in which a cell divides into two daughter cells, each with the same number of chromosomes as were present in parent cell.

Mitotic Spindle: In prophase, centrosomes give rise to microtubules by joining tubulin proteins present in cytoplasm. The microtubules thus formed are called spindle fibres. Complete set of spindle fibres is know as mitotic spindle fiber.

5.2.1 Phases of Mitosis

15. Give the names of phases of mitosis.

OR Define karyokinesis and cytokinesis.

OR Differentiate between karyokinesis cytokinesis.

OR What is meant by cytokinesis?

OR Define karyokinesis.

Ans. There are two major phases of mitosis.

(i) Karyokinesis: The division of the nucleus is known as karyokinesis.

(ii) Cytokinesis: The division of cytoplasm is known as cytokinesis.

16. Name the phases of Karyokinesis.

Ans. (i) Prophase (ii) Metaphase (iii) Anaphase (iv) Telophase

17. What is kinetochore?

Ans. Each chromosome has kinetochore at centromere. Kinetochore is a complex protein structure that is the point where spindle fibers attach.

18. Differentiate between S-phase and

G2 phase.

OR Describe S-phase.

Ans. The difference between S-plase and G2 phase is given below:

S-phase:

In s-phase cell duplicates its chromosomes. As a result each chromosome consists of two sister chromatids.

G-2 Phase:

In the G-2 phase cell prepares proteins that are essential for mitosis, mainly for production of spindle fibres.

19. What is Mitotic Spindle?

OR How are spindle fibres formed during prophase of mitosis?

Ans. In prophase, centrosomes give rise to microtubules by joining tubulin proteins present in cytoplasm. The microtubules thus formed are called spindle fibres. Complete set of spindle fibres is known as mitotic spindle.

20. How Cytokinesis occur in animal cells?

OR What is meant by Cleavege furrow?

Ans. In animal cells, cytokinesis occurs by process known as cleavage. A cleavage furrow develops where the metaphase plate used to be. The furrow deepens and eventually pinches the parent cell into two daughter cells.

21. How cytokinesis is different in plant cells as compared to animal cells?

OR How does cytokinesis occur in animal cells?

OR How cytokinesis occurs?

OR How cytokinesis occur in plant cells?

OR What basic difference in cell division of plants and animals?

Ans. Cytokinesis in plants: Cytokinesis in plant cells occurs differently. Vesicles derived from the Golgi apparatus move to the middle of the cell and fuse to form a membrane-bounded disc called the cell plate or phragmoplast. The plate grows outward and more vesicle fuse with it. Finally, the membranes of the cell plate fuse with the plasma membrane and its contents join the parental cell wall. The result is two daughter cells, each bounded by its own plasma membrane and cell wall.

Cytokiness in animals: Cytokinesis in animal cells, cytokinesis occurs by a process known as cleavage. A cleavage furrow develops where the metaphase plate used to be. The furrow deepens and eventually pinches the parent cell into two daughter cell.

22. What is Phragmoplast? How it forms?

OR What is meant by Phragmoplast?

OR What is the function of phragmoplast in plant cell?

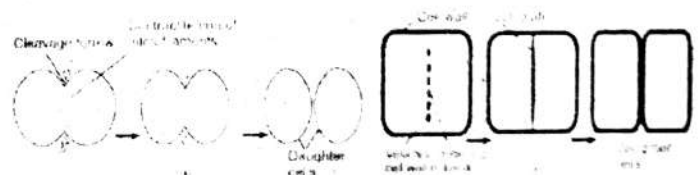
OR What is meant by phragmoplast in mitosis?

OR What is meant by Phragmoplast?

OR What do you known about Phragmoplast?

Ans. Cytokinesis in plant cells occurs differently. Vesicles derived from the Golgi apparatus move to the middle of cell and fuse to form a membranous disk. This disk is known as cell plate or phragmoplast.

23. Show the Cytokinesis Process in an Animal and Plant Cells with the help of Diagram.

Ans:

5.2.2 Significance of Mitosis

24. Write two significances of Mitosis?

OR Give the importance of Mitosis.

Ans. Cell replacement: New cells are formed by mitosis and so are exact copies of the cells being replaced. Red blood cells have short life span (about 4 months) and new red blood cells are formed by mitosis.

Regeneration: Some organisms can regenerate lost parts of their bodies. The production of new cells is achieved by mitosis like Sea star regenerates its lost arm through

mitosis.

25. Define alternation of generations.

Ans. Alternation of Generations:

(i) Plants show alternation of generation in their life cycle.

(ii) Diploid sporophyte generation undergoes Meiosis and form haploid spores which grow to produce haploid gametophyte generation.

(iii) Gametophyte generation under go mitosis to form haploid gametes which unite to produce diploid zygote. Zygote grows through mitosis into diploid sporophyte generation.

26. What is Regeneration? Give an example.

OR Describe rde of mitosis in regeneration.

OR What do you know about Sea Star (Star Fish)?

Ans. Regeneration: Some organisms can regenerate parts of their bodies. The production of new cells is achieved by mitosis like sea star regenerates its lost part by regeneration.

Example: sea star regenerates its lost arm through mitosis.This process is called regenration.

27. What is the role of mitosis in development and growth.

Ans. Importance of mitosis is the maintenance of chromosomal set. The number of cells within an organism increased by mitosis. This is the basis of the development of cellular body from a single cell like zygote and also the basis of the growth of multicellular body.

28. Explain briefly how asexual reproduction occurs in Hydra?

OR Describe asexual repredoction with example.

Ans. Asexual Reproduction in Hydra:

(i) Asexual reproduction in Hydra takes place through Budding.

(ii) During Budding, Cells on the surface of body of Hydra undergoes mitosis and a cluster of cells are formed called Bud.

(iii) Mitosis continues in cells of bud and it increase in size to form a new Hydra.

Errors in Meitosis

29. What are tumors?

Ans. Tumors are abnormal cells which grow due to abnormal division of cells.

30. What are benign and Malignant Tumors?

OR Write about kinds of Tumors.

OR What is difference about Malignant and benign tumors?

Ans. Benign tumor:

If tumors remain in their original location for a long time they are called benign tumors.

Malignant tumor:

If tumor invade other tissues, they are called malignant or cancerous tumors and their cells are called cancer cells. Such tumor can send cancer cells to other parts in body where new tumors may form.

31. What is meant by Metastasis? OR Define metastasis.

Ans. Malignant tumors can send the cancer cells to other parts in the body where new tumors may form. This phenomenon is called metastasis means (spreading of diseases).

32. Why are tumors dangerous for human body?

Ans. Tumors become dangerous for human body when they attack on other tissues of the body. Such tumors are called malignant or cancerous tumors. Such tumors send cancerous cells to other parts of the body where they form new tumors. This process of spreading of disease is called Metastasis.

5.3 Meiosis

33. Define Meiosis. Which biologist discover Meiosis?

Ans. Meiosis: Meiosis is a process in which a Eukaryotic diploid cell divide and forms four haploid cells.

Discover: Meiosis was discovered and described for the first time in 1816 by a German biologist Oscar Hertwig.

34. Write difference between mitosis and meiosis.

OR. Define Mitosis and Meiosis.

OR Give two difference in Mitosis and

Meiosis.

Ans. Meiosis:

(i) Meiosis was discovered and described for the first time in 1816 by a German biologist Oscar Hertwig.
(ii) In this process of cell division, One parent cell produce four daughter cells.
(iii) Due to meiosis, each daughter cell have half number of chromosomes as present in parent cell.
(iv) Meiosis takes place is germ cells.
(v) Crossing over and mutation takes place in this process.

Mitosis:

(i) This process was first observed by a German biologist Walther Flemming in 1880's.
(ii) In this process of cell division each parent cell produce two daughter cells.
(iii) By mitosis each daughter cell have same number of chromosomes as present in parent cell.
(iv) Mitosis takes place in somatic cell.
(v) Crossing over and mutation never occures.

35. Differentiate diploid and Haploid cell.
OR What is meant by Haploid cell?

Ans.
(i) Diploid (2n) means the cells in which chromosomes are in pairs (homologous pairs).
(ii) while haploid (n) means the cells with half number of chromosomes i.e. chromosomes are not in the form of pairs.

36. Differentiate between somatic and germ cells?
Define somatic cells.

Ans. Somatic cells:
(i) Somatic cells are those which form the body of organisms.
(ii) Somatic cells undergo mitosis.

Germ cells:
(i) Germ line cells are those which give rise of gametes.
(ii) Germ line cells undergo meiosis.

37. Plants do not make their gametes by meiosis. Why?

Ans. Plants do not make their gametes by meiosis because plants gametes are already haploid (n).

5.3.1(A) Phases of Meiosis

38. Define Synapsis.
OR Define the act of Synapsis.
OR When and how does synapsis occur?

Ans. During prophase 1 of Meiosis 1 homologous chromosomes line up with each other and form pairs by a process called Synapsis.

39. Define Crossing Over. OR What is crossing over?

Ans. The exchange of segments between the non-sister chromatids of homologus chromosomes during meiosis.

40. When chiasmata are formed ?
OR Define Chiasmata.

Ans: Chiasmata are formed during the Prophase-I of meiosis-I. These are the point of attachments between non-sister chromatids of homologous chromosomes.

41. Write down function of chiasmata in crossing over process.
OR Define Chiasmata.

Ans. Chiasmata are point of attachments between non-sister chromatids of homologous chromosomes. It is the first step for irregular exchange of chromosomal segments.

42. Write difference between chiasmata and crossing over.

Ans. Chiasmata:
Point of attachment of Non-sister chromatids of homologous pair of chromosomes during prophase-I of Meiosis-I.

Crossing Over:
Exchange of chromosomal segments between Non-sister chromatids of homologous chromosome during prophase-I of Meiosis-I.

43. What changes are placed in telophase I during meiosis?

Ans. In telophase, I Chromosomes arrive at the poles. Each pole now has half the number of chromosomes but each chromosome still consists of two chromatids. The spindle network disappears, and nuclear envelope is formed around each haploid set. The chromosomes uncoil back into chromatin.

44. When and who discovered crossing over in Drosophilla Melanogaster?

Ans: In 1911, the american geneticist Thomas Hunt Morgan discovered the phenomenon of crossing over in fruit fly Drosophila melanogaster.

5.3.1 Significance of Meiosis

45. Write significance of Meiosis in term of variation in organisms.

OR What is the improtance crossing over.

Ans.

(i) The chromosomes pairs of each parent undergo crossing over during meiosis. So daughter cells i.e. gametes have genetic variations.

(ii) When gametes fuse and form zygote, its genetic make up is different from both parents. Thus meiosis allows a species to bring variations in the next generations.

(iii) Beneficial variations help organisms to adapt to the changes in environment.

46. When and who discovered crossing over in Drosophilla Melanogaster?

Ans: In 1911, the american geneticist Thomas Hunt Morgan discovered the phenomenon of crossing over in fruit fly Drosophila melanogaster.

5.3.2 Errors in Meiosis

47. What are the effects of errors in meiosis?

OR What is difference between disjunction and non disjunction?

OR What is meant by non-disjunction of chromosomes?

Ans. Disjunction:

During anaphase I, chromosomes separate and go to opposite poles while during anaphase II sister chromosomes separate. It is called disjunction.

Non-Disjunction:

Sometimes the separation is not normal and it is called non-disjunction. This results in the production of gametes which have either more or less than the normal number of chromosomes. If such abnormal gamete fuses with a normal gamete, it results abnormal chromosome number in next generation, for example 47 or 45 chromosomes in humans.

5.4 Apoptosis And Necrosis

48. What is necrosis? write down its two causes:

OR Write any four causes of necrosis.

Ans. Necrosis: The accidental death of cells and tissues is called Necrosis.

Causes:

(i) Necrosis may be caused by wounds, infections, cancer etc.

(ii) Spider bite may cause necrosis in some parts of the body.

(iii) Necrosis may be caused when a cell is given hypoxic environment.

49. Write two sources of occurrence of necrosis.

Ans. (i) Injury (ii) Infection (iii) Cancer.

50. Define Apoptosis.

OR Explain Apoptosis.

Ans. Apoptosis is one of the main types of programmed cell death. It occur when cell damaged or undergoes stress conditions.

51. What is the improtance of Apoptosis?

OR Write benefits of Apoptosis.

Ans.

i- Apoptosis can occur when a cell is damaged or undergoes stress conditions. Apoptosis removes the damaged cell, preventing it from getting further nutrients, or to prevent the spread of infections.

ii- Apoptosis also gives advantages during development. For example during the formation of fingers, the cells between them undergo apoptosis and the digits separates.

52. Define Blebs. What is another name of these?

OR What is meant by Apoptotic Bodies?

Ans. During apoptosis, cell shrinks and becomes rounded due to the breakdown of cytoskeleton by enzymes. Its chromatin undergoes condensation and nuclear envelope breaks. In this way, nucleus spreads in the form of several discrete chromatin bodies. Cell memebrane makes irregular buds known as blebs. Blebs break off from the cell and are now called apoptotic bodies, which are then phagocytosed by other cells.

53. Write the differene between apoptosis and necrosis.

Ans. Difference between apoptosis and necrosis is given below:

Apoptosis:

Apoptosis is one of the main types of programmed cell death.

Apoptosis can occur when a cell is damaged or undergone stress conditions.

Necrosis:

Necrosis is the accidental death of cells and living tissues.

Necrosis may occur when a cell is given hypoxic environment, infection, cancer etc.

54. What is the role of Lysosome in necrosis?

Ans: During necrosis, there is a release of special enzymes from lysosomes. Lysosomal enzymes break cellular components and may also be released outside cell to break surrounding cells. Cells that die by necrosis may also release harmful chemicals that damage other cells.

Long Question (Unsloved)

5.1

1. What is cell cycle. Explain G1 phase, S phase and G0 phase.

OR Describe different phases of Eukaryotic Cell Cycle.

OR Describe three/four phases of interphase during cell cycle.

OR What is cell cycle? Explain its different phases in detail?

5.2 **5.2.1**

2. Explain the diffeent phases of division of nuclear.
3. Explain metaphase and anaphase.
4. Describe prophase of mitosis in detail.

OR Describe about four stages of mitosis.

5. Write a note on cytokinesis.

5.2.2

6. What is the significance of Mitosis.

5.3 **5.3.2**

7. Write down the significance of Meiosis.
8. Write four differences of Mitosis and Meosis.

OR Compare mitosis and meiosis.

5.4

9. Write a detailed note on Apoptosis.

OR Write down a short note on Apoptosis and Necrosis.

OR How cell die? Explain.